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| Unit Detail: **Change happens**  (Change is movement from one state to another) | |
| Term: *2* Year level: *3 - 4* Curriculum level: *2* Unit length (weeks): *4 weeks of 2 hours per week* | |
| Curriculum learning area: *Science*  Strand: *Material World*  **Global Society – Change Happens Focus: Fizzing & Foaming.**  **Properties and changes of matter:**  *Observe, describe and compare physical and chemical properties of common materials and changes that occur when materials are mixed, heated or cooled.*  Strand: *Chemistry and society*  *Find out about the uses of common materials and relate these to their observed properties.*  Secondary Strands: *Nature of Science*  **Understanding about science:**  *Appreciate that scientists ask questions about our world that lead to investigations and that open-mindedness is important because there may be more than one explanation.*  **Investigating in science**  *Extend their experiences and personal explanations of the natural world through exploration, play, asking questions and discussing simple models.*  *Incorporating Written English into topic procedures, instructions.* | How to introduce the unit and key competencies to the students (the hook):  *Science Bob “Crazy Foam”* [*video*](https://www.youtube.com/watch?v=p1eG2y2mn54)  *Felt Pen – Filter Paper experiment* [*chromatography*](https://www.youtube.com/watch?v=8uFLOQ18Mt8)  ***Ask the ‘big questions’:***  *Why does change happens?*  *What are everyday examples of change?*  *How does change affect our lives?*  *What if things did not change?* |
| Organisation | Abilities / Needs / ESOL / Group Lists | |
| *Mixed ability groups*  *Class discussion – whole class and small groups*  ***Identify ESOL focus areas*** | ***ESOL*** *– ESOL teacher, in class support using buddies to interpret, students modeling language for these students, simplified tasks*  ***Target groups*** *– Pasifika students and boys below the mid year standard in writing who will require support in designing and developing brief.*  ***Special Needs*** *– Teacher aide where timetabled to support the writing of the briefs*  ***More able –*** *extended activities in research, presentations, peer tutoring* | |
| Key Competency focus: Thinking✔ Managing Self  Relating to Others✔ Participating and Contributing ✔Using Language, Symbols and Text  *Thinking is about using creative, critical, and metacognitive processes to make sense of information, experiences, and ideas. These processes can be applied to purposes such as developing understanding, making decisions, shaping actions, or constructing knowledge. Intellectual curiosity is at the heart of this competency.*  *Students who are competent thinkers and problem-solvers actively seek, use, and create knowledge. They reflect on their own learning, draw on personal knowledge and intuitions, ask questions, and challenge the basis of assumptions and perceptions.* | | |

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| Unit Overview | |
| Title | CHANGE HAPPENS – Fizzing & Foaming |
| Unit Aim | ***Materials can change.***  *Changes can be permanent.*  ***Some changes are reversible.***  *Some materials react with each other-this is called a chemical change.*  ***Some chemical reactions release a gas***  *Heat can cause some materials to expand.*  *Students extend their experiences and personal explanations of the natural world through exploration, play, asking questions and discussing simple models.* |
| Curriculum Document Values | |
| Excellence  Innovation, Inquiry, Curiosity✔ Diversity  Equity  Ecological Sustainability  Community and Participation✔ Integrity  Respect  **Innovation, inquiry, and curiosity**, by thinking critically, creatively, and reflectively  **Community and participation** for the common good   * express their own values * explore, with empathy, the values of others * critically analyse values and actions based on them * discuss disagreements that arise from differences in values and negotiate solutions   *Ask questions, investigate, share information and be open-minded to the views of others.* | |
| Digital Literacy Focus | |
| Task Definition ✔ Information Seeking Strategies Location and Access  Use of Information ✔ Synthesis  Evaluation  *Exploring the features of change.*  *Investigate everyday changes that affect our lives.*  *Finding out how and why change happens.*  *Exploring why change is important.* | |
| Global Learning Intentions of unit – the BIG ideas students MUST get | |
| Why can’t things stay the same?  How did this change?  Science is in the kitchen and all around us | |
| Misconceptions anticipated | |
| *Materials are unchangeable.*  *Common materials are not exciting.*  *I mix things and nothing happens (what causes change to happen?).* | |
| Key Vocabulary for this unit | |
| *Fizzy, foaming, mixing, change, hot, cold, bubbles, oxygen, carbon dioxide, bitter, sour, sweet, acid, carbonate, substance, reaction* | |
| Assessment / Culminating activity | |
| Self Assessment Peer assessment  Learning reflection ✔ Presentation  Display✔ Podcast / wiki entry / blog entry✔ Performance  Practical Skills Teacher Observation Learning conversation✔ Written assessment ✔e-asTTle assessment Oral assessment  Other (describe)  What is the assessment task(s) (rubric, product, etc.)? Please describe:  ***Science****: Sequencing a Change Pre & Post test (see attached documents)* | |

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| Unit implementation – Learning experiences and instruction | | |
| Learning Intentions (to be shared with whole class). We Are Learning To (WALT): | Learning Experiences / Activities  (ICT / SOLO / Multiple Intelligences / Blooms / Authentic Experiences / etc.) | Assessment  Diagnostic / Formative / Summative / Feedback  See Tracking Sheet of stepping stones.  Success Criteria  We Are Successful When (WASW): |
| Bringing in Ideas (Identify / Label / List / Define / Describe / Retell / Recall/ Recite)  **Change**  ***Chemical Changes (these***  ***are understandings for teachers to)***  ***Materials can change.***  *Changes can be permanent.*  ***Some changes are reversible.***  *Some materials react with each other-this is called a chemical change.*  ***Some chemical reactions release a gas***  *Heat can cause some materials to expand.*  ***Define*** *change*  ***Describe*** *change*  ***Compare and contrast*** *change*  ***Sequence*** *a change*  ***Analyse*** *change*  ***Classify*** *change*  *Generate* ***questions*** *about change*  *Write* ***predictions*** *about change*  **Materials Required**  *washing soda*  *baking soda*  *bicarbonate of soda*  *citric acid*  *tartaric acid*  *icing sugar*  *cornstarch*  *raro or flavouring*  *salt*  *lemon juice*  *orange juice*  *vinegar*  *grapefruit juice*  *tomato juice*  *full cream milk*  *food colour (red, blue & yellow)*  *detergent*  *epson salt or rock salt*  *baby oil*  *essential oil(s)*  *cooking oil*  *cotton buds*  *cordial*  *chalk*  *balloons*  *measuring spoons*  *funnels*  *plastic plates*  *plastic spoons*  *baking trays* | **Year 3/4**  **Fizzing and Foaming**  Making Better Sense of the Material World  ***1. Zing and Zest***  ***2. Sherbert Fizz -*** [***video***](https://www.youtube.com/watch?v=RNDIWahdnuY)  ***3. Chemical Popguns (activity 4 page 79)***  ***4. Dancing Raisins & others -*** [***video***](https://www.youtube.com/watch?v=m0LxZXyOOEk)  ***5. Lava Lamps – Science Bob*** [***video***](https://www.youtube.com/watch?v=WayviQkusxI) ***&*** [***video***](https://www.youtube.com/watch?v=Lw9ykCgIPNo)  ***6. Bath Salts – Mother’s Day gift (11th May) -*** [***video***](https://www.youtube.com/watch?v=vPFhQdfipmE)  ***7. Milk Marbling -*** [***video***](https://www.youtube.com/watch?v=mc5ljuG4FYE)  1. Multistructural Outcome - **Describe change**  2. Relational Outcome - **Sequence a change**  3. Extended Abstract Outcome - **Predict an outcome of change**  ***Language Ideas***  ***Fizz*** *– when acid is mixed with carbonate. Carbon dioxide gas is formed – escaping gas is causes the fizzing page 74 MOE*  ***Foam*** *– a mass of bubbles of air or gas in a matrix of liquid film*  ***Particles*** *– a minute portion of matter*  ***Matter*** *– anything that takes up space and has three states solid/liquid/gas*  ***Solid –*** *a state of matter that is hard because the molecules are fixed together*  ***Liquid –*** *a state of matter that is free flow*  ***Gas –*** *a state of matter that has no fixed shape*  ***Dissolving*** *– the process which solid particles react with liquid particles*  ***Substance*** *– materials that things are made of.*  ***Zing and Zizz***  ***Carbonates*** *– a liquid that has been charged with carbon dioxide, washing soda, baking powder, lime stone, chalk or marble, crushed egg shells, vitamin C tablets*  ***Acids –*** *lemon juice, orange juice, vinegar, grapefruit juice, tomato juice*  ***Sherbet Fizz*** *– citric acid, tartaric acid, cordial*  ***Chemical Popguns*** *– sodium bicarbonate, vinegar*  ***Catastrophic Currants*** *– vinegar, bicarbonate soda, carbon dioxide, dried currants*  ***Corny Glue*** *– Cornflour*  ***Goo*** *– a goo is a mixture that acts much like quick sand* | describe common materials  describe changes you can see when materials are heated, mixed or cooled.  describe why these changes have happened  use scientific language such as acid, carbonate, materials, chemical, physical, predict, test  classify properties of common materials  compare and contrast physical and chemical properties of common materials  sequence the changes when common materials are mixed (heated or cooled)  compare and contrast the changes that occur when common materials are mixed (heated or cooled)  explain the causes of the changes that occur when common materials are mixed (heated or cooled)  use scientific language such as acid, carbonate, materials, chemical, physical, predict, test, carbon dioxide, common, substances  ***Book List***  ***Science Journals***  *Connected no. 1 2003*  *Connected no. 3 2005 (paper)*  *Connected no. 1 2000 (grow your own crystals)*  *Connected no. 3 1998 (How to make marble paper)*  ***Journals***  *Part1, No.4, 1999*  ***Library***  *The Science of cooking – Laura Whitehead*  *Kitchen Lab Michael Ross*  *Backyard Science no.2 in the kitchen (507.8)*  *Incredible science (506.8)*  ***Readers***  *Volcanoes Box 18 Senior Reading*  *The Science of cooking 29/1*  *Soup 15/22*  *Feeling Funny 21/4*  *Make a shake and a bakeless cake*  *Giant Soup 19/36*  ***Teacher Resources***  *501 Science Experiments –*  *Science for Kids – Hot and Cold*  *McMillan Science – Teacher’s resource Book exploring changes*  *Making sense of the Materials world – L1-4*  *McMillian Science Investigation Books – level 1* |

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| Linking Ideas (Sequence / Classify/ Compare / Contrast / Cause Effect / Explain / Question) | *Sequence the timeline actions on a calendar:*   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | *Needs* | *Materials* | *Action Plan* | *Practical activities* | *Presentation* | | | *Week 1* |  |  |  |  |  | | | *Week 2* |  |  |  |  |  | | | *Week 3* |  |  |  |  |  | | | *Week 4* |  |  |  |  |  | | | *Week 5* |  |  |  |  |  | | | *Week 6* |  |  |  |  |  | | | *Week 7* |  |  |  |  |  | | | *Week 8* |  | | | | |   *Brief needs to have a ‘conceptual statement’ which describes what the product is that to be made and why it is being made*    *Brief to focus on answering questions such as:*  *What will it be used for?*  *What will it look like?*  *What will it be made out of?*  *Where will it be used?*  *Who will use it?*  *Why am I making it?* | | *… each student/group has a personal timeline*  *…each student/group writes a brief which answer the focus questions* |
| **Putting linked ideas in another context**: (Predict/ Hypothesise / Generalise / Imagine / Reflect / Evaluate / Create)  *… to create experiment brief*  *…to identify materials required*  *…to present experiment and findings* | *Brief is completed by students about their chosen item (sherbet fizz, milk print, filter & pen experiment)*  *Science Laboratory experiments used as introduction to presenting information on change.*  *Use of iPad video to record and present findings* | | *….each student/group has completed a brief in relation to their item(s).*  *… materials/sequence of experiment identified.*  *… presentation to group about their experiments and findings.* |
| **Resources:**  [Matter wiki page](http://room5matter.wikispaces.com/) - interactive games on States of Matter  [neoK12](http://room5matter.wikispaces.com/) - interactive site - lots of short videos on different states of matter  [3 States of Matter](http://www2.mcdaniel.edu/Graduate/TI/pages/LEWIS/matterweb.htm) - definitions of 3 states  [Interactive experiments](http://classroom.jc-schools.net/sci-units/matter.htm#4) - different levels - excellent trial, predict & test procedures  [Matter Vocabulary](http://idahoptv.org/dialogue4kids/season7/matter/vocabulary.cfm) - a few links  [Matter Vocabulary2](http://idahoptv.org/dialogue4kids/season7/matter/facts.cfm) - more links & videos  YouTube Videos  [Fizzing & Foaming](http://www.youtube.com/watch?v=ksWuGnoq8rY&feature=related) - student led - has other links to videos at the side  [Air Pressure](http://www.youtube.com/watch?v=Wd4zrNT7FvU&feature=fvwrel) - child commentary  [Air Pressure](http://www.youtube.com/watch?v=hd7vbYzodoo&feature=fvwrel) - as above - no commentary (do this with your class - you’ll amaze them!)  [Milk & detergent](http://www.youtube.com/watch?v=bmxhH7QMnJ8&feature=related) – Fun experiment  [Soda & Mentos](http://www.youtube.com/watch?v=Dme2J0wccJY&feature=related) - very dramatic presentation  [Myth Busters](http://www.youtube.com/watch?v=Dme2J0wccJY&feature=related) - scientific reason behind the above - Good for Cause & Effect  [Room 4 wiki](http://room4sunnynook.wikispaces.com/home) - Matter, Fizzing & Foaming [science activities](http://room4sunnynook.wikispaces.com/Fizzing-Foaming) & [videos](http://room4sunnynook.wikispaces.com/Topic) | | | |
| End of unit - means of recording student reflection  Possible focus questions for reflection:  What did I do well?  What would I change?  Where to next?  *Self – Assessment: a sequencing rubric based on SOLO on how the process might go (pre-test) and how it went (post-test).* | | Report: *Topic*   |  |  |  |  |  | | --- | --- | --- | --- | --- | | *Student Name* | *Understands main idea of topic study* | *Gathers information from a range of sources* | *Discusses ideas and findings* | *Applies thinking strategies* | | *Janet* | *Below* | *At* | *Above* | *At* | | *John* |  |  |  |  |   *Art*   |  |  |  |  |  | | --- | --- | --- | --- | --- | | *Student Name* | *Participates in identifying needs* | *Participates in identifying actions to be take* | *Participates in identifying helping groups and contacting them* | *Explores a variety of ideas, techniques and media in visual art* | | *Janet* | *Below* | *At* | *Above* | *At* | | *John* |  |  |  |  | | |
| **Reflection for Subsequent Planning** | | | |